

**FACT SHEET FOR NPDES PERMIT WA0020401**  
**CITY OF WOODLAND WASTEWATER TREATMENT PLANT**

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## **INTRODUCTION**

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) of permits, which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the state of Washington to administer the NPDES permit program. Chapter 90.48 Revised Code of Washington (RCW) defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

<b><u>GENERAL INFORMATION</u></b>	
Applicant	City of Woodland
Facility Name and Address	Woodland Wastewater Treatment Plant 100 Treatment Plant Road Woodland, WA 98674
Type of Treatment:	Sequencing Batch Reactor, Activated Sludge with UV Disinfection
Discharge Location	Lewis River Latitude: 45° 54' 04" N                      Longitude: 122° 44' 10" W.
Water Body ID Number	1225781459549

## **BACKGROUND INFORMATION**

### *DESCRIPTION OF THE FACILITY*

#### HISTORY

The City of Woodland began collecting and treating its wastewater in the mid-1950s. The facility was upgraded in 1974 and again in 1993. The 1993 upgrade used a process of Submerged Biological Reactors (SBC) and disinfected with chlorine. The facility experienced numerous violations with the old SBC system which had become overloaded. A moratorium on new connections was placed on the system. In 2002 construction was completed on a new plant which uses Sequencing Batch Reactors (SBR) and used Ultra-Violet (UV) disinfection. The moratorium on new construction was lifted upon completion of the new plant and the community has added approximately 330 new connections.

#### COLLECTION SYSTEM STATUS

The collection system has approximately 97,587 feet of sewer collection pipe and 13,922 feet of force main. The oldest pipe was installed before 1960. There is approximately 21,908 feet of this older non-gasketed concrete pipe that is slated for replacement at a rate of 500 to 1000 feet per year. The Infiltration and Inflow (I/I) from the older pipes can be extensive in systems of this type. The area of the city is relatively flat which results in the need to pump the wastewater up to a height so as to gravity flow to the force main pump stations. There are 13 pump stations with a 14th pump station under construction.

#### TREATMENT PROCESSES

Flow enters the plant from a force main. The influent is monitored at an influent station prior to being screened by a Heliseive separator and a bar screen and then to a grit chamber. Flow is monitored by a Parshall Flume with an ultrasonic flow meter. The flow is split to enter a pair of Sequencing Batch Reactors (SBRs). A third SBR was constructed at the same time as the first two basins, but is not in use at this time (not shown on the schematics). The third basin is ready in case of emergency back-up or for future expansion. The rated capacity of the POTW includes the use of this third basin. The sludge is sent to a series of basins where it is aerobically digested and gravity thickened. The water decanted from the SBRs during the clarifying cycle is disinfected with Ultra-Violet light. The final effluent gravity flows to the river from a concrete basin that used to serve as the chlorine contact chamber. During high flows the effluent must be pumped from the basin to the river. The effluent flow is measured at a weir in the basin and there is also an effluent monitoring station in the basin.

Residential flows make up about 80 percent of the flows to the treatment facility. Commercial, industrial, and institutional flows make up the other 20 percent of the wastewater flows. There is a dog food manufacturing facility (Northwest Pet Products) that is the most significant industrial discharger. There are several restaurants, retail stores, and service stations in collection area. The Oak Tree Restaurant is one of the largest. These sources appear to discharge a large amount of settleable BOD. The City has pretreatment requirements in Chapter 13.08 of the City of Woodland Municipal Code Title 13 Water and Sewage, 1998. It is important for the City to continue to enforce the pretreatment requirements on the industrial and commercial dischargers.

The facility is classified as Class III Treatment Plant based on the design flow of 2.0 mgd and treatment of activated sludge. The facility must have an operator in responsible charge of the plant of at least a Group III certification and any operators in charge of each shift must have at least a Group II certification.

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The facility is operated from 7:00 a.m. to 3:00 p.m., Monday through Friday, and an operator is at the plant for four hours on weekends and eight hours on non-weekend holidays.

There is still an outstanding debt of approximately \$150,000 from a Public Works Trust Fund (PWTF) loan from 1992 for the old facility. The new facility was funded by a variety of sources: PWTF \$3.3 million loan, State Revolving Fund \$1.4 million loan, Centennial Clean Water Fund \$2.3 million grant, Cowlitz County Grant \$500,000, and a Community Development Block Grant \$300,000.

*DISCHARGE OUTFALL*

The outfall consists of a 16-inch diameter concrete pipe with a single 16-inch diameter port that ends approximately 60-feet into the river and is embedded in a concrete footing. The Lewis River is shallow and at 7Q10 minimum flow, the water at the discharge point is approximately 6.25-feet deep.

*RESIDUAL SOLIDS*

The treatment facility removes solids during the treatment of the wastewater at the headworks (grit and screenings), and at the SBRs, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local solid waste transfer station. Solids removed from the SBRs are treated in a pair of aerobic digesters and a gravity thickener. The final biosolids in liquid form are hauled away by Fire Mountain Farms in Lewis County which has a permit from the Department to land apply the biosolids.

*PERMIT STATUS*

The previous permit for this facility was issued on February 1, 1999, and was modified on December 24, 2002, to accommodate the upgrade. The previous permit (as modified) placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD<sub>5</sub>), Total Suspended Solids (TSS), pH, and Fecal Coliform bacteria.

An application for permit renewal was submitted to the Department on October 12, 2003, and accepted by the Department on November 25, 2003.

*SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT*

The facility received its last inspection on March 17, 2004. All systems at the facility appeared to be operating well and properly with two SBR basins running. No problems were noted at that time.

During the history of the previous permit, but specifically during the last two years since the upgrade took place, the Permittee has remained in compliance. This view is based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. The facility has been running exceptionally well in the last two year since being rebuilt. The table below shows many of the parameters of concern under the last permit.

*WASTEWATER CHARACTERIZATION*

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

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**Table 1: Wastewater Characterization Based on May 2002 – March 2004 DMRs**

Parameter	Concentration & Loading	Previous Limits
Flow	0.47 mgd avg, 0.73 max	2.0 mgd
BOD	3.5 mg/L avg, 19 mg/L max	30 mg/L monthly, 45 weekly
	14.3 lbs/day avg, 67 lbs/day max	466 lbs/day monthly max
	98.8% avg removal rate	85% minimum
TSS	2.8 mg/L avg, 5 mg/L max	30 mg/L monthly, 45 weekly
	12.2 lbs/day avg, 21 lbs/day max	474 lbs/day monthly max
	99.3% avg removal rate	85% minimum
Fecal Coliform bacteria	116 org/100 ml 95 <sup>th</sup> percentile	200 org/100 ml monthly 400 org/100 ml weekly
pH	6.5 minimum	6.0 minimum
	7.8 maximum	9.0 maximum
Temperature	23° C 95 <sup>th</sup> percentile	No limit
Dissolved Oxygen	1.9 mg/L 5 <sup>th</sup> percentile	No limit

The BOD concentrations were held low with the average at 3.5 mg/L. The pounds of BOD discharged appears low compared to the limit, however, the limit was set based on design capacity of the plant. The plant is designed to handle 2.0 mgd, but did not process more than 0.47 mgd and the maximum flow did not exceed 0.73 mgd (approximately 36 percent of capacity). The TSS was also held low averaging 2.8 mg/L and the pounds of suspended solids discharged averaged 12.2 lbs/day. The fecal coliform was disinfected by ultra-violet (UV) light and 95 percent of the samples were below 116 org/100 ml. This value is well below the limits of 200 org/100 ml monthly, but still higher than expected after UV disinfection. The pH was held well within the limits. Temperature and dissolved oxygen will be discussed later in the fact sheet.

*SEPA COMPLIANCE*

No current State Environmental Policy Act (SEPA) action is necessary at this time because no construction is taking place and no facility plans are currently being updated.

**PROPOSED PERMIT LIMITATIONS**

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not

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authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

*DESIGN CRITERIA*

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the City of Woodland General Sewer Plan and Facility Plan prepared by Gibbs & Olson, Inc. 1999, the 2003 Operation & Maintenance Manual, and as built drawings and are as follows:

**Table 2: Design Standards for the City of Woodland WWTP.**

Parameter	Design Quantity
Monthly average flow (max. month)	2.0 MGD
Instantaneous peak flow	3.2 MGD
BOD <sub>5</sub> influent loading	3,107 lbs/day
TSS influent loading	3,160 lbs/day
NH <sub>4</sub> -N influent loading	356 lbs/day*
Design population equivalent	12,089

\*As-built NH<sub>4</sub>-N capacity was slightly higher than (320 lbs/day on page V-13 of approved General Sewer Plan

*TECHNOLOGY-BASED EFFLUENT LIMITATIONS*

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD<sub>5</sub>, and TSS are taken from Chapter 173-221 WAC are:

**Table 3: Technology-based Limits.**

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 ml Weekly Geometric Mean = 400 organisms/100 ml
BOD <sub>5</sub> (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L



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Parameter	Limit
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

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The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly BOD<sub>5</sub> effluent mass loadings (lbs/day) were calculated as the maximum monthly influent design loading (3,107 lbs/day) x 0.15 = 466 lbs/day.

The weekly BOD<sub>5</sub> average effluent mass loading is calculated as 1.5 x monthly loading = 700 lbs/day.

Monthly TSS effluent mass loadings (lbs/day) were calculated as the maximum monthly influent design loading (3,160 lbs/day) x 0.15 = 474 lbs/day.

The weekly TSS average effluent mass loading is calculated as 1.5 x monthly loading = 711 lbs/day.

Ammonia has a design limit of 356 lbs/day. Because the facility is equipped with the ability to remove nitrogen, a narrative ammonia limit will be used in the permit where the Permittee must remove ammonia to the maximum extent practicable with the existing equipment. This means that the Permittee must operate the blowers and supply the air necessary to remove nitrogen and operate the selectors in order to have the proper food to mass ratio in order to nitrify and denitrify. Ammonia will be re-evaluated at the next permit cycle after enough information has been gathered to evaluate toxicity.

*SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS*

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

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NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

ANTIDegradation

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the Lewis River which is designated as a Class A receiving water in the vicinity of the outfall. There are no other point source outfalls within one mile upstream or down stream of the Woodland outfall. Significant nearby non-point sources of pollutants include livestock and forest practices upstream in the Lewis River Valley.

Characteristic uses of Class A water include the following: water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

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**SURFACE WATER QUALITY CRITERIA**

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliform	100 organisms/100 ml maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

There are no 303(d) limitations on this fork of the Lewis River and therefore, no TMDLs.

**CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA**

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the 3PLUMESa computer model (Gibbs & Olson 1999). Dilution modeling was conducted for several scenarios based on projected construction and design flows at the facility:

Original Construction Phase	Effluent Flow	Acute Dilution Factor	Chronic Dilution Factor
Pre-1999 conditions	0.46 mgd	13	157
Phase I	0.78 mgd	10	117
Phase II	1.57 mgd	9	74
Phase III	4.8 mgd	4	28

The General Sewer Plan (G&O, 1999) was predicting that the facility would grow in these three phases shown in the table above. However, the facility was built to a design flow of 2.0 mgd (average maximum month) which is somewhere between phase II and III. Over the last two years of operation (May 2002—March 2004) the actual flow had a maximum of 0.73 mgd (about 37 percent of the design flow). It should be more than the five years of the permit cycle before the facility goes beyond the flows used in phase II modeling. The full build-out in the City under the scenario of phase III will not occur for some time to come.

Because there were not enough metals or ammonia data, a reasonable potential analysis could not effectively be calculated. For this reason, the permit requires metals and ammonia sampling to be conducted over the next five years and data to be submitted with the next permit application.

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Flows should be reevaluated again in five years and it is likely that the dilution will be lowered if the flows have increased.

The Department Permit Writer's Manual describes the flow to use when doing dilution modeling. "For acute dilution use the highest daily max plant effluent flow during the critical season. And for chronic dilution use the highest monthly average flow during the critical season." The dilution factors for this permit are based on the actual flows which are very close to the phase I flows shown above. The plant maximum flow over the last two years was 0.73 mgd and the monthly average maximum was 0.62 mgd. However the City is expected to grow and may very well pass the phase I levels. Therefore the phase II dilution will be used. These dilution factors are:

	Acute	Chronic
Aquatic Life	9:1	74:1

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the Lewis River is the seven-day average low river flow with a recurrence interval of ten years (7Q10). The ambient background data used for this permit includes the following from the Department ambient monitoring station 27C080 on the Lewis River:

Parameter	Value used
7Q10 low flow	789 cfs
Velocity	1.01 ft/sec
Depth	6.25 ft (centerline at outfall), 2.9 ft avg.
Width	281 feet
Roughness (Manning)	n=0.0
Slope	5.0E-04 (0. degrees)
Temperature	14.16° C (90 <sup>th</sup> percentile June-October)
pH (high)	7.5 (90 <sup>th</sup> percentile)
Dissolved Oxygen	9.9 mg/L (90 <sup>th</sup> percentile)
Total Ammonia-N	0.01 mg/L (90 <sup>th</sup> percentile)
Fecal Coliform	12/100 ml (10 <sup>th</sup> percentile)
Turbidity	2.17 NTU
Hardness	11 mg/L as CaCO <sub>3</sub> (average from old data)
All Metals	0.0 (assumed to be below detection limits)

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The above ambient data is based mainly on the most recent data available from the Lewis River which was from 1991 and 1992. Hardness was not available in that data set and was based on 1972 data. No metals have been sampled and are assumed to be below detection

BOD<sub>5</sub>--This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water. The dissolved oxygen was modeled with simple mixing (see appendix C) and resulted in a dissolved oxygen of 9.79 mg/L. With a criteria of 8.0 mg/L there does not appear to be a problem.

Temperature and pH--The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables were dilution factor 117, upstream temperature 14.16°C, upstream pH 7.5, upstream alkalinity 13(as mg CaCO<sub>3</sub>/L), effluent temperature 23°C, effluent pH of 6.5, effluent pH of 7.8, and effluent alkalinity 150 (as mg CaCO<sub>3</sub>/L assumed). The predicted temperature at the boundary of the chronic mixing zone is 14.28°C and the incremental rise is 0.12°C. The resultant rise in temperature is less than the 0.3°C allowed by the criterion. The pH is well within the limits of the criteria.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitations for pH were placed in the permit and temperature was not limited. However, effluent temperature sampling must continue and the ambient temperature will need to be monitored in the summer. This is necessary to evaluate the present condition and will be used to further evaluate ammonia toxicity.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 74.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The 1999 permit did not limit or require sampling of ammonia or any heavy metals in either the effluent or the ambient environment. The narrative ammonia limit requires that the plant be operated so as to oxidize ammonia. This is based on the fact that data was not available to conclusively determine whether an ammonia limit is required. There are also no metals data for the ambient environment. The new permit will require testing of priority pollutants in both the effluent and in the ambient environment. Testing for hardness and temperature in the ambient environment will be required to further characterize the toxicity of the effluent. Clean sampling techniques for metals must be used if the samples are to be considered valid.

The metals listed in 40 CFR Chapter 1, part 122(D) Table III. This sampling for priority pollutant metals must be conducted a minimum of three times over the life of the permit with the final results due before the next permit application is due in approximately four and a half years. These metals in table III include:

- Antimony

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- Arsenic
- Beryllium
- Cadmium
- Chromium
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Thallium
- Zinc

The effluent metals must be analyzed as total recoverable, whereas the ambient metals must be analyzed as dissolved.

A water sampling and quality assurance project plan (QAPP) will be required in the new permit and must be submitted prior to the start of sampling. This information may result in a permit modification or limits in the next renewal.

When sampling, the water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal. The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

Ammonia must be reduced to the best extent practicable as described above under Technology Based Effluent Limitations

#### WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

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In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit contains requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. The proposed permit requires the Permittee to conduct toxicity testing for one year in order to characterize both the acute and chronic toxicity of the effluent.

If acute or chronic toxicity is measured during effluent characterization at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity, then the proposed permit will set a limit on the acute or chronic toxicity. The proposed permit will then require the Permittee to conduct WET testing in order to monitor for compliance with either an acute toxicity limit, a chronic toxicity limit, or both an acute and a chronic toxicity limit. The proposed permit also specifies the procedures the Permittee must use to come back into compliance if the limits are exceeded.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC<sub>50</sub>, EC<sub>50</sub>, IC<sub>25</sub>, etc. All accredited labs have been provided the most recent version of the Department Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Department Publications Distribution Center 360-407-7472 for a copy. The Department recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

When the WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits but will be required to use rapid screening tests to assure toxicity doesn't appear. If a rapid screening test indicates that toxicity has appeared, the Permittee will investigate immediately and take appropriate action.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted in response to rapid screening tests fails to meet the performance standards in WAC 173-205-020 "whole effluent toxicity performance standard."

When the WET tests during effluent evaluation indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

Because the facility was rebuilt, a WET test is needed to determine if any toxicity is occurring. It does not appear that toxicity testing has been conducted in the past. It is recommended that toxicity testing be conducted twice during the first year of operation (once in the winter and once in the summer for evaluation of acute and chronic toxicity). If no toxicity shows up, then it is likely that no more testing will be needed.

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**HUMAN HEALTH**

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

**SEDIMENT QUALITY**

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

*GROUND WATER QUALITY LIMITATIONS*

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

**MONITORING REQUIREMENTS**

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring for ammonia, temperature, and priority pollutants is being required to further characterize the effluent. These pollutants could have a significant impact on the quality of the surface water.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual* (July 1994) for a major facility with a design flow greater than 1.0 mgd and using the activated sludge process.

*LAB ACCREDITATION*

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of*



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*Environmental Laboratories.* The laboratory at this facility is accredited for general chemistry and microbiology which includes BOD, CBOD, Cl, DO, pH, TSS, and Fecal Coliform.

**OTHER PERMIT CONDITIONS**

*REPORTING AND RECORDKEEPING*

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

*PREVENTION OF FACILITY OVERLOADING*

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

*OPERATION AND MAINTENANCE (O&M)*

The proposed permit contains condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

*RESIDUAL SOLIDS HANDLING*

To prevent water quality problems the Permittee is required in permit condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards, WAC 173-201A, and Biosolids Handling regulations covered under WAC 174-308.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by the Department under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the local County Health Department.

*PRETREATMENT*

*Federal and State Pretreatment Program Requirements*

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department has been delegated authority to administer the Pretreatment Program (i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works). Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system and administering surcharges for higher strength waste). The requirements for a Pretreatment Program are contained in Title

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40, part 403 of the Code of Federal Regulations. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8(f)(1)(i)].

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge [WAC 173-216-110(5)]. (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.) Industrial dischargers need to apply for a State Waste Discharge Permit 60 days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities [40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.].

The City of Woodland will be required to enforce a rate structure under their municipal code for high strength wastewater from dischargers to the City's treatment plant. These high strength discharges may include industry and large restaurants with waste that is higher in BOD, grease, etc. which may therefore be difficult and more costly to treat. The permit requires the Permittee to charge the higher rates for higher strength waste.

*Wastewater Permit Required*

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

*Requirements for Routine Identification and Reporting of Industrial Users*

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system." Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State Waste Discharge Permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State Waste Discharge Permit application.

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*Requirements for Performing an Industrial User Survey*

This POTW has the potential to serve significant industrial or commercial users and is required to perform an Industrial User Survey. The goal of this survey is to develop a list of SIUs and PSIUs, and of equal importance, to provide sufficient information about industries which discharge to the POTW, to determine which of them require issuance of State Waste Discharge Permits or other regulatory controls. An Industrial User Survey is an important part of the regulatory process used to prevent interference with treatment processes at the POTW and to prevent the exceedance of water quality standards. The Industrial User Survey also can be used to contribute to the maintenance of sludge quality, so that sludge can be a useful biosolids product rather than an expensive waste problem. An Industrial User Survey is a rigorous method for identifying existing, new, and proposed significant industrial users and potential significant industrial users. A complete listing of methodologies is available in the Department's guidance document entitled "Conducting an Industrial User Survey."

*Duty to Enforce Discharge Prohibitions*

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum based oils, or which results in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

*Support by the Department for Developing Partial Pretreatment Program by POTW*

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

*OUTFALL EVALUATION*

Proposed permit condition S11 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

*GENERAL CONDITIONS*

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

**PERMIT ISSUANCE PROCEDURES**

*PERMIT MODIFICATIONS*

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

*RECOMMENDATION FOR PERMIT ISSUANCE*

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for five years.

## **REFERENCES FOR TEXT AND APPENDICES**

### Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
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1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

### Gibbs & Olson, Inc.

1999. City of Woodland General Sewer Plan and Facility Plan. G & O File No. 876.44, Longview, Washington.

### Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

### Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

### Washington State Department of Ecology.

Laws and Regulations( <http://www.ecy.wa.gov/laws-rules/index.html> )

Permit                      and                      Wastewater                      Related                      Information  
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

### Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

### Water Pollution Control Federation.

1976. Chlorination of Wastewater.

### Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

**APPENDIX A--PUBLIC INVOLVEMENT INFORMATION**

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on May 16, 2004, and May 24, 2004, in the *Longview Daily News* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on December 15, 2004, in the *Longview Daily News* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Carey Cholski  
Water Quality Permit Administrator  
Department of Ecology  
Southwest Regional Office  
P.O. Box 47775  
Olympia, WA 98504-7775.

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone (360) 407-6554, or by writing to the address listed above.

This permit and fact sheet were written by Eric Schlorff.

## **APPENDIX B--GLOSSARY**

**Acute Toxicity**--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

**AKART**-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

**Ambient Water Quality**--The existing environmental condition of the water in a receiving water body.

**Ammonia**--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

**Average Monthly Discharge Limitation** --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

**Average Weekly Discharge Limitation** -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Best Management Practices (BMPs)**--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

**BOD<sub>5</sub>**--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD<sub>5</sub> is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

**Bypass**--The intentional diversion of waste streams from any portion of a treatment facility.

**CBOD<sub>5</sub>** – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD<sub>5</sub> is given in 40 CFR Part 136.

**Chlorine**--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

**Chronic Toxicity**--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

**Clean Water Act (CWA)**--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

**Combined Sewer Overflow (CSO)**--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

**Compliance Inspection - Without Sampling**--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

**Compliance Inspection - With Sampling**--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

**Composite Sample**--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

**Construction Activity**--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

**Continuous Monitoring** --Uninterrupted, unless otherwise noted in the permit.

**Critical Condition**--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

**Dilution Factor**--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

**Engineering Report**--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

**Fecal Coliform Bacteria**--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

**Grab Sample**--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

**Industrial User**-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

**Industrial Wastewater**--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.



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**Infiltration and Inflow (I/I)**--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

**Interference** -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued there under (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

**Major Facility**--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Maximum Daily Discharge Limitation**--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Method Detection Level (MDL)**--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

**Minor Facility**--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Mixing Zone**--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

**National Pollutant Discharge Elimination System (NPDES)**--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

**Pass through** -- A discharge which exits the POTW into waters of the--State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

**pH**--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

**Potential Significant Industrial User**--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

**Quantitation Level (QL)**-- A calculated value five times the MDL (method detection level).

**Significant Industrial User (SIU)**--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process waste stream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority\* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority\* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

\*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

**State Waters**--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

**Stormwater**--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

**Technology-based Effluent Limit**--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

**Total Suspended Solids (TSS)**--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

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**Upset**--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

**Water Quality-based Effluent Limit**--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

## APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov/programs/wq/wastewater/index.html>.

Dissolved oxygen concentration following initial dilution.

References: EPA/600/6-85/002b and EPA/430/9-82-011

Based on Lotus File IDOD2.WK1 Revised 19-Oct-93

### INPUT

1. Dilution Factor at Mixing Zone Boundary:	74
2. Ambient Dissolved Oxygen Concentration (mg/L):	9.9
3. Effluent Dissolved Oxygen Concentration (mg/L):	1.9
4. Effluent Immediate Dissolved Oxygen Demand (mg/L):	0

### OUTPUT

Dissolved Oxygen at Mixing Zone Boundary (mg/L):	9.79
--	------

#### INPUT

1. Ambient Temperature (deg C; 0<T<30)	14.3
2. Ambient pH (6.5<pH<9.0)	7.80
3. Acute TCAP (Salmonids present- 20; absent- 25)	20
4. Chronic TCAP (Salmonids present- 15; absent- 20)	15

#### OUTPUT

1. Intermediate Calculations:	
Acute FT	1.48
Chronic FT	1.48
FPH	1.12
RATIO	14
pKa	9.59
Fraction Of Total Ammonia Present As Un-ionized	1.6097%

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2. Un-ionized Ammonia Criteria

Acute (1-hour) Un-ionized Ammonia Criterion (ug NH<sub>3</sub>/L) 156.6

Chronic (4-day) Un-ionized Ammonia Criterion (ug NH<sub>3</sub>/L) 35.7

3. Total Ammonia Criteria:

Acute Total Ammonia Criterion (mg NH<sub>3</sub>+ NH<sub>4</sub>/L) 9.7

Chronic Total Ammonia Criterion (mg NH<sub>3</sub>+ NH<sub>4</sub>/L) 2.2

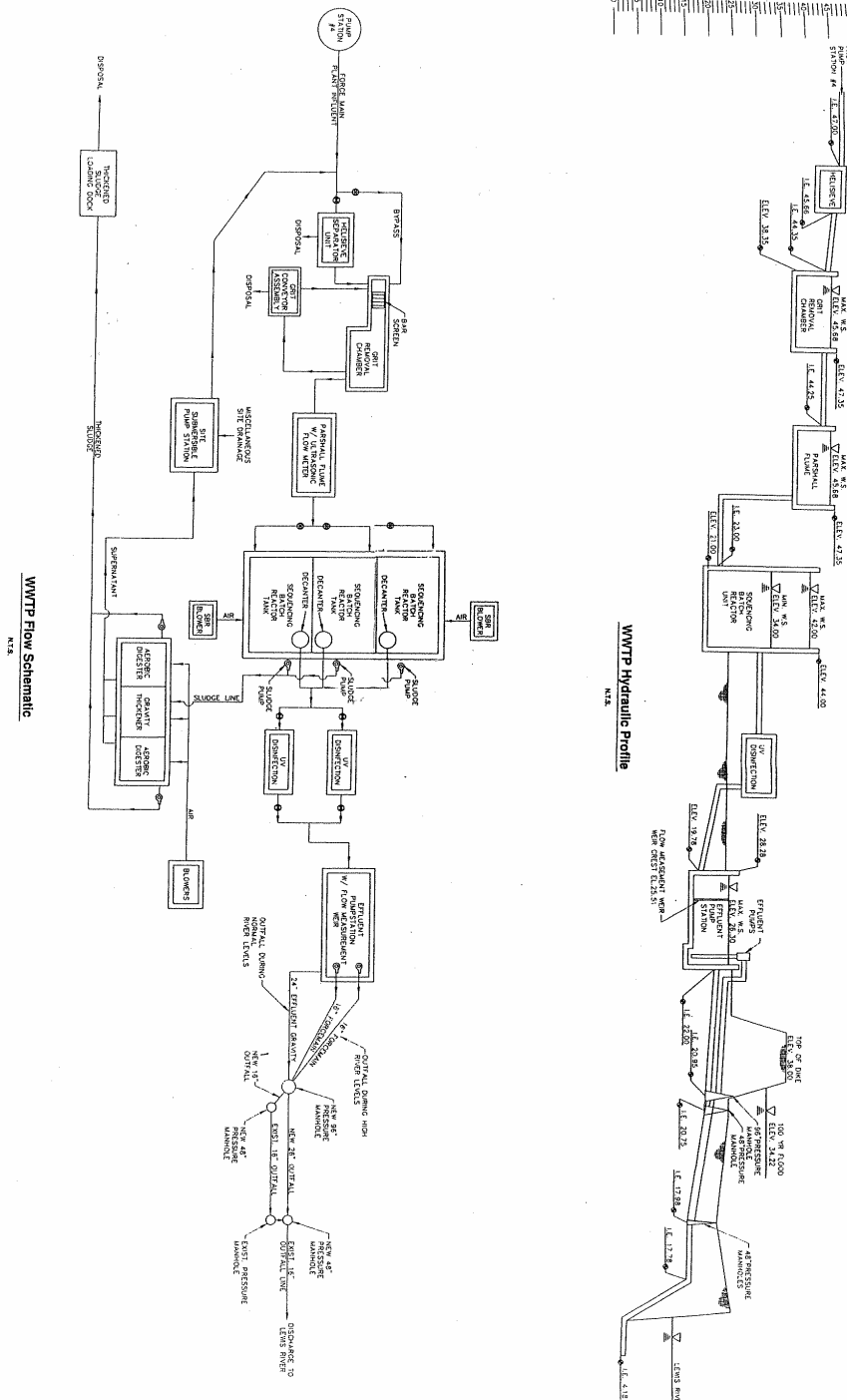
4. Total Ammonia Criteria expressed as Nitrogen:

Acute Ammonia Criterion as mg N 8.0

Chronic Ammonia Criterion as N 1.82

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Drawing supplied with application modified by permit writer to show third SBR basin 6/15/04



City of Woodland		Hydraulic Profile and Flow Schematic	
Wastewater Treatment Plant			
Woodland, Washington			

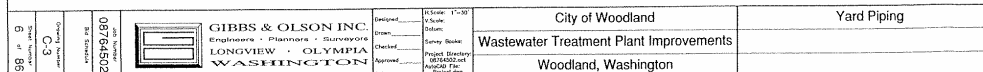


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WASHINGTON

Drawn	Checked	Approved
Date	Date	Date
By	By	By

08/6/4502	08/6/4502
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08/6/4502	08/6/4502

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APPENDIX D--RESPONSE TO COMMENTS

**The following comments were received from the City of Woodland on January 19, 2005. Responses from the Department for follow the comments.**

Comment 1:

Page 4 - Item S4C should be changed to read S4.D for consistency.

Response:

There was an error and the change will be made.

Comment 2:

Page 7 - In the Monitoring Schedule table, the sample point for wastewater effluent flow is listed as "Effluent Parshall Flume." This should be modified to read as "Effluent Weir."

Response:

The language change will be made as requested.

Comment 3:

Page 7 - In the Monitoring Schedule table, the line items under Wastewater Effluent for lbs/day for both BOD<sub>5</sub> and TSS should have the sample type changed from 24-hour composite to calculation, similar to the % removal items. Additionally, the line item under Wastewater Effluent for lbs/day for ammonia should have the sample type changed from Grab to calculation.

Response:

It is partially correct that the resulting number is calculated. However this calculation is only after determining the concentration for a 24-hour sample and the flow over that 24-hour period. It is important to have it stated that a 24-hour composite sample be used for the calculation. Therefore the language will remain unchanged.

Comment 4:

Page 20 - The table of pollutant parameters indicates that Arsenic shall be tested for both total (T) and inorganic (i), however, the first sentence of the first paragraph below the table indicates that metals shall be sampled and tested as total recoverable except for arsenic which is tested as inorganic. The City believes these two items should be consistent.

Response:

There was an error in the text and the change will be made so that the text matches the table.



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Comment 5:

Page 21 - The second to last paragraph should be revised to read as follows: "If an effluent limit for acute toxicity is required by subsection B at the end of one year of effluent characterization, the Permittee shall immediately complete all applicable requirements in subsections C and D." Currently subsection F is also listed and the permit contains no subsection F under Special Condition S9.

Response:

Section F was missing and is necessary to explain testing procedures. The section F will be inserted and the reference to section F will remain.

Comment 6:

Page 21 - The last paragraph should be revised to read as follows: "If no effluent limit is required by subsection B at the end of one year of effluent characterization, then the Permittee shall complete all applicable requirements in subsection E." Currently subsection F is also listed and the permit contains no subsection F under special condition S9.

Response:

Section F was missing and is necessary to explain testing procedures. The section F will be inserted and the reference to section F will remain.

Comment 7:

Page 22 - The first paragraph under subsection C currently requires monitoring to determine compliance with the effluent limit to be done twice per year for the remainder of the permit term using each of the species listed in subsection A on a rotating basis. The City respectfully requests that this paragraph be revised to require monitoring twice per year for the remainder of the permit cycle using the species selected by the Permittee from those listed in subsection A. This request is made because the City is concerned about potential inconsistencies in the monitoring which could arise if the City is required to utilize different laboratories to monitor for different species. It is our current understanding that not all testing laboratories maintain populations of all the species listed in subsection A.

Response:

The language will need to stay as is. Once a species is chosen, the permittee will need to continue to use those same species and preferably the same lab for consistency. Every laboratory accredited by Washington State to do bioassay analysis has all of the species listed.

Comment 8:

Page 22 - Following the last paragraph of subsection C it appears appropriate to insert a new paragraph that reads similar to the last paragraph under Section S10, subsection C, except that, rather than providing for potential removal of chronic toxicity from future permits, the new paragraph would provide for the potential removal of acute toxicity from future permits.

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Response:

The language will need to stay as is. The language for acute and chronic toxicity is written differently on purpose. There are different requirements for acute and chronic toxicity testing by rule.

Comment 9:

Page 24 - Second paragraph requires chronic toxicity tests to be conducted with the following two species – *Pimephales promelas* (fathead minnow) and *Ceriodaphnia dubia* (water flea). To simplify the toxicity testing program the City requests that we be allowed to use the same two species that we use for the acute toxicity testing. As such, we also request that Ecology allow us to use, for the chronic testing, any one of the three species of *Daphnia* listed for acute toxicity testing.

Response:

The language will need to stay as is. The language for acute and chronic toxicity is written differently on purpose. There are different requirements for acute and chronic toxicity testing by rule.

Comment 10:

Page 24 - First paragraph under Section 10, subsection B should be revised to read as follows: "After completion of effluent characterization, the Permittee has an effluent limit for chronic toxicity if any test conducted for effluent characterization shows a significant difference between the control and the ACEC at the 0.05 level of significance using hypothesis testing (Appendix H, EPA/600//4-89/001) and shall complete all applicable requirements in subsections C and D." Currently subsection F is also listed and the permit contains no subsection F under Special Condition S10.

Response:

Section F was missing and is necessary to explain testing procedures. The section F will be inserted and the reference to section F will remain.

Comment 11:

Page 24 - Second paragraph under Section 10, subsection B should be revised to read as follows: "If no significant difference is shown between the ACEC and the control in any of the chronic toxicity tests, the Permittee has no effluent limit for chronic toxicity and only subsection E applies." Currently subsection F is also listed and the permit contains no subsection F under Special Condition S10.

Response:

Section F was missing and is necessary to explain testing procedures. The section F will be inserted and the reference to section F will remain.

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*Fact Sheet for NPDES Permit WA0020401 Comments:*

Comment 12:

Page 3 - The second paragraph incorrectly indicates there is still an outstanding debt of approximately \$8.02 million from a Public Works Trust Fund (PWTF) loan from 1992 for the old facility. The outstanding debt from the 1992 plant upgrade is approximately \$150,000.

Response:

This will be corrected as requested.

Comment 13:

Page 3 - The paragraph under DISCHARGE OUTFALL incorrectly indicates that the outfall port is 10-inches in diameter. The outfall port is 16-inches in diameter because the 16"x10" reducer was removed as part of the construction of the new treatment plant.

Response:

This will be corrected as requested.

**The following comment was received by Bill Fox of Cosmopolitan Engineering on January 5, 2005.**

Comment:

The mixing zone description in Section S1.B is incorrectly based on the "river and Stream" classifications in WAC 173-201A-100(7)(a) and (8)(a). The mixing zone should be properly classified as "estuary" under WAC 173-201A-100(7)(a) and (b). This conclusion is based on the fact that the tidal influence on the Columbia River causes the Lewis River under critical conditions to intermittently reverse direction and flow upstream during flood tides and low river discharge. Therefore, there may be more dilution achieved within the mixing zone than credited in the permit, and the cited acute and chronic dilution factors should be re-evaluated.

The Department contends that the receiving water should be classified as a river for mixing zone criteria on the basis of the following excerpt from WAC 173-201A-100(7):

...this size limitation [for river] may be applied to estuaries having flow characteristics that resemble rivers...

This interpretation has been tested and rejected in other similar discharge situations. Most notably, for the Cowlitz wastewater discharge to the Columbia River in Longview, the Department differentiated between "tidally-influenced" and "tidally-reversed" receiving water environments (8/14/98 memorandum from Norm Glenn, Ecology, to Darrel Anderson and Al Bolinger, Ecology). The Department concluded that "tidally-influenced" is a term consistent with "estuaries having flow characteristics that resemble rivers." "Tidally-reversed" was found to be consistent with the estuarine mixing zone classification. These same estuarine hydrodynamic conditions exist at Woodland.

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This mixing zone classification was contested again under an NPDES permit appeal to the PCHB by the City of Snohomish. Like Longview, Snohomish discharges to a fresh water, tidally-reversed estuary in which the Department applied riverine mixing zone criteria. The appeal was settled with estuarine mixing zone criteria applied in the permit and in the mixing zone study.

Response:

The assumption from Mr. Fox's comment is not entirely correct. The Lewis River is by definition a fresh water tributary to the Columbia River and is not an estuary as shown in the water quality standards WAC 173-201A-120. This does not mean that the water body does not have a flow reversal. The shape of the mixing zone appears to be what Mr. Fox is alluding to. The Department has allowed in some permits the use of a mixing zone that is 200 feet upstream and 200 feet downstream of the diffuser ports (plus the depth) rather than 100 feet upstream and 300 feet downstream of the diffuser ports (plus the depth). This is the shape of a mixing zone that is recommended for use in estuaries and in rivers that have flow reversal. This shape of mixing zone has been used only on a case-by case basis where there was documented and frequent flow reversal. Note also that both mixing zone shapes have a total length of 400 feet. This mixing zone for flow reversal is not a redefinition of the water body as an estuary. It should also be noted that any river mixing zone must not exceed more than 25 percent of flow or more than 25 percent of width. The 1999 General Sewer and Facility Plan shows that at max SBR decant rate at full buildout, the maximum dilution factors cannot exceed 27.5:1 for chronic and 3.7:1 for acute. Another consideration that must be taken in a river with flow reversal is whether either centerline or flux average dilution is most appropriate. In a river where the flow reverses along a single line up or down stream, centerline dilution is likely the more appropriate model to use.

In the case of the Woodland discharge, the dilution study shown in Chapter III of the 1999 General Sewer and Facility Plan uses the typical riverine mixing zone size of 100 feet up and 300 feet down stream. The subsequent dilution modeling and resulting dilution factors were based on this unidirectional mixing zone shape. Therefore, in order to change the mixing zone shape, the modeling would have to be redone. Furthermore, data supporting the conclusion that the river at the outfall location does reverse has not been provided to the Department.

If the Permittee desires to pursue a new mixing zone shape and modeling of new dilution factors which are based on flow reversal, they will need to submit a new facility plan during the next permit cycle. There will need to be documentation of the flow reversal and its frequencies as well as reasons why a centerline or flux average model is better to use than the other. Any dilution modeling will need to be calibrated against any existing dye studies. At this time, the Department will continue to use the original dilution study that was conducted, submitted and approved by the Department in the 1999 facility plan.